NATIONAL GUIDELINE CLEARINGHOUSE™ (NGC) GUIDELINE SYNTHESIS

SCREENING FOR LUNG CANCER

Guidelines

1. **American College of Chest Physicians (ACCP)**. Screening for lung cancer: ACCP evidence-based clinical practice guidelines. Chest 2007 Sep;132(3 Suppl):69S-77S. [41 references]
2. **U.S. Preventive Services Task Force (USPSTF)**. Lung cancer screening: recommendation statement. Ann Intern Med 2004 May 4;140(9):738-9. [2 references]

INTRODUCTION

A direct comparison of American College of Chest Physicians (ACCP) and U.S. Preventive Services Task Force (USPSTF) recommendations for lung cancer screening in asymptomatic patients is provided in the tables below.

The tables below provide a side-by-side comparison of key attributes of each guideline, including specific interventions and practices that are addressed. The language used in these tables, particularly that which is used in Table 3, Table 4, and Table 5, is in most cases taken verbatim from the original guidelines.

- Table 1 provides a quick-view glance at the primary interventions considered by each group.
- Table 2 provides a comparison of the overall scope of the guidelines.
- Table 3 provides a more detailed comparison of the specific recommendations offered by each group for the topics under consideration in this synthesis.
- Table 4 lists the potential benefits and harms associated with the implementation of each guideline as stated in the original guidelines.
- Table 5 presents the rating schemes used to rate the level of evidence and/or the strength of the recommendations.

A summary discussion of the areas of agreement and areas of differences among the guidelines is presented following the content comparison tables.

Listed below are common abbreviations used within the tables and discussions:

- ACCP, American College of Chest Physicians
- CT, computed tomography
- CXR, chest x-ray

- LDCT, low-dose computed tomography (i.e., spiral or helical computed tomography)
- USPSTF, United States Preventive Services Task Force

TABLE 1: COMPARISON OF INTERVENTIONS AND PRACTICES CONSIDERED
("✓" indicates topic is addressed)

	ACCP (2007)	USPSTF (2004)
CXR	✓	✓
LDCT	✓	✓
Sputum cytology	✓	✓

TABLE 2: COMPARISON OF SCOPE AND CONTENT

Objective and Scope	
ACCP (2007)	• To provide updated, evidence-based, clinically relevant guidelines for the early detection of lung cancer
USPSTF (2004)	• To summarize the current U.S. Preventive Services Task Force (USPSTF) recommendation on screening for lung cancer and the supporting scientific evidence • To update the 1996 recommendations contained in the *Guide to Clinical Preventive Services*, second edition
Target Population	
ACCP (2003)	• United States • Individuals at risk for lung cancer but without symptoms or a history of cancer
USPSTF (2004)	• United States • Asymptomatic persons seen in primary care settings
Intended Users	

ACCP (2007)	Advanced Practice Nurses Allied Health Personnel Health Care Providers Nurses Patients Physicians Psychologists/Non-physician Behavioral Health Clinicians Social Workers
USPSTF (2004)	Advanced Practice Nurses Allied Health Personnel Nurses Physician Assistants Physicians

TABLE 3: COMPARISON OF RECOMMENDATIONS FOR LUNG CANCER SCREENING	
ACCP (2007)	• We do not recommend that low-dose helical CT be used to screen for lung cancer except in the context of a well-designed clinical trial. **Grade of recommendation, 2C** • We recommend against the use of serial CXR to screen for the presence of lung cancer. **Grade of recommendation, 1A** • We recommend against the use of single or serial sputum cytologic evaluation to screen for the presence of lung cancer. **Grade of recommendation, A**
USPSTF (2004)	The USPSTF concludes that the evidence is insufficient to recommend for or against screening asymptomatic persons for lung cancer with either LDCT, CXR, sputum cytology, or a combination of these tests. **I recommendation** **Clinical Considerations** • The benefit of screening for lung cancer has not been established in any group, including asymptomatic high-risk populations such as older smokers. The balance of harms and benefits becomes increasingly unfavorable for persons at lower risk, such as nonsmokers. • The sensitivity of LDCT for detecting lung cancer is 4 times greater than the sensitivity of CXR. However, LDCT is also associated with a greater number of false-positive results, more radiation exposure, and increased costs compared with CXR. • Because of the high rate of false-positive results, many patients will undergo invasive diagnostic procedures as a result of lung cancer screening. Although the morbidity and mortality rates from

	these procedures in asymptomatic individuals are not available, mortality rates because of complications from surgical interventions in symptomatic patients reportedly range from 1.3% to 11.6%; morbidity rates range from 8.8% to 44%, with higher rates associated with larger resections. • Other potential harms of screening are potential anxiety and concern as a result of false-positive tests, as well as possible false reassurance because of false-negative results. However, these harms have not been adequately studied.

TABLE 4: BENEFITS AND HARMS OF LUNG CANCER SCREENING	
Benefits	
ACCP (2007)	Appropriate screening of patients at risk for lung cancer
USPSTF (2004)	The USPSTF found fair evidence that screening with LDCT, CXR, or sputum cytology can detect lung cancer at an earlier stage than lung cancer would be detected in an unscreened population; however, the USPSTF found poor evidence that any screening strategy for lung cancer decreases mortality.
Harms	
ACCP (2007)	Not stated
USPSTF (2004)	• Because of the invasive nature of diagnostic testing and the possibility of a high number of false-positive tests in certain populations, there is potential for significant harms from screening. Therefore, the USPSTF could not determine the balance between the benefits and harms of screening for lung cancer. • Other potential harms of screening are potential anxiety and concern as a result of false-positive tests, as well as possible false reassurance because of false-negative results. However, these harms have not been adequately studied.

TABLE 5: EVIDENCE RATING SCHEMES AND REFERENCES

ACCP (2007)	**Quality of Evidence Scale** **High (A)** Randomized controlled trials (RCTs) without important limitations or overwhelming evidence from observational studies **Moderate (B)** RCTs with important limitations (inconsistent results, methodologic flaws, indirect, or imprecise) or exceptionally strong evidence from observational studies **Low or very low (C)** Observational studies or case series **Strength of Recommendations** **1A** - Strong recommendation **1B** - Strong recommendation **1C** - Strong recommendation **2A** - Weak recommendation **2B** - Weak recommendation **2C** - Weak recommendation
USPSTF (2004)	The USPSTF grades the quality of the overall evidence for a service on a 3-point scale (good, fair, poor): **Good** Evidence includes consistent results from well-designed, well-conducted studies in representative populations that directly assess effects on health outcomes. **Fair** Evidence is sufficient to determine effects on health outcomes, but the strength of the evidence is limited by the number, quality, or consistency of the individual studies, generalizability to routine practice, or indirect nature of the evidence on health outcomes. **Poor** Evidence is insufficient to assess the effects on health outcomes because of limited number or power of studies, important flaws in their design or conduct, gaps in the chain of evidence, or lack of information on important health outcomes. The USPSTF grades its recommendations according to one of 5

	classifications (A, B, C, D, I) reflecting the strength of evidence and magnitude of net benefit (benefits minus harms): **A** The USPSTF strongly recommends that clinicians provide [the service] to eligible patients. The USPSTF found good evidence that [the service] improves important health outcomes and concludes that benefits substantially outweigh harms. **B** The USPSTF recommends that clinicians provide [the service] to eligible patients. The USPSTF found at least fair evidence that [the service] improves important health outcomes and concludes that benefits outweigh harms. **C** The USPSTF makes no recommendation for or against routine provision of [the service]. The USPSTF found at least fair evidence that [the service] can improve health outcomes but concludes that the balance of benefits and harms is too close to justify a general recommendation. **D** The USPSTF recommends against routinely providing [the service] to asymptomatic patients. The USPSTF found at least fair evidence that [the service] is ineffective or that harms outweigh benefits. **I** The USPSTF concludes that the evidence is insufficient to recommend for or against routinely providing [the service]. Evidence that [the service] is effective is lacking, of poor quality, or conflicting and the balance of benefits and harms cannot be determined.

GUIDELINE CONTENT COMPARISON

The American College of Chest Physicians (ACCP) and the U.S. Preventive Services Task Force (USPSTF) present recommendations for screening for lung cancer based on evidence available at the time of each report and provide explicit reasoning behind their judgments. Both groups rate the quality of their recommendations and the type of evidence supporting them and include a review of the evidence supporting their recommendations.

Areas of Agreement

Both groups are in general agreement regarding the inappropriateness of routine lung cancer screening in asymptomatic individuals and note the need for more research into the effectiveness of screening for lung cancer. USPSTF mentions the National Cancer Institute's Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Trial as a prospective study that may eventually provide additional insight. ACCP addresses the National Cancer Institute's National Lung Screening Trial (NLST).

Chest X-ray

Neither guideline recommends CXR to screen for lung cancer in asymptomatic patients. ACCP explicitly recommends against screening for lung cancer with CXR, while USPSTF concludes that there is insufficient evidence to recommend for or against screening for lung cancer with chest x-ray.

Low-Dose Computed Tomography

Both guidelines agree directly or indirectly that LDCT is more sensitive than CXR in detecting lung cancer. They also acknowledge, however, that this greater test sensitivity may be associated with a higher rate of false positives, which may result in the use of additional diagnostic procedures that carry a significant risk of harms. The groups further note that currently, the evidence is not yet sufficient to determine whether or not detection of smaller lung cancers with LDCT reduces lung cancer mortality.

ACCP does not recommend that LDCT be used to screen for lung cancer except in the context of a well-designed clinical trial. USPSTF concludes that there is insufficient evidence to recommend for or against the use of LDCT to screen asymptomatic patients at risk for lung cancer.

Sputum Cytology

Neither guideline recommends the use of sputum cytology for screening for lung cancer. ACCP explicitly recommends against its use, while USPSTF finds insufficient evidence to recommend for or against the technology.

Areas of Differences

There are no significant areas of difference between the guidelines.

This synthesis was prepared by ECRI on October 8, 2005. This synthesis was verified by: CTFPHC on November 2, 2005; ACCP on November 28, 2005; USPSTF on November 30, 2005; and ACS on December 2, 2005. This synthesis was revised on January 13, 2008 to update ACCP recommendations and again in November 2008 to remove ACS and CTFPHC recommendations.

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